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Management of Retained Products of Conception with Marked Vascularity

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Abstract

Cases of retained products of conception (RPOC) with marked vascularity present a clinical challenge because simple dilation and curettage (D&C) can lead to life-threatening hemorrhage. We describe here two cases of hypervascular RPOC that were successfully managed with two different approaches.

Case 1: A 26-year-old woman with history of 3 D&C's was transported to the emergency room for heavy vaginal bleeding 45 days after the spontaneous abortion. Diagnosis of RPOC with aneurysm-like structure was considered and uterine artery embolization (UAE) was performed. Four days after the UAE, reduction of the vascularity of RPOC was confirmed on color Doppler ultrasonography and D&C was successfully carried out.

Case 2: A 37-year-old woman with history of 1 cesarean section became pregnant after the regular menses. She underwent D&C for missed abortion at 8 weeks' gestation. Seven days after the D&C, sonographically heterogenous mass emerged in the vicinity of the previous cesarean scar. Thereafter, the mass gradually grew larger and diagnosis of hypervascular placental polyp was considered. As the amount of vaginal bleeding was small, expectant management was instituted. Sixty-one days after the first D&C, reduction of the vascularity of RPOC was confirmed on color Doppler ultrasonography and D&C was successfully completed.

Introduction

Retained product of conception (RPOC) is defined as a portion of placental tissue that remained in the uterine cavity after abortion or term delivery. RPOCs are estimated to occur after approximately 1% of term pregnancies and probably more often after spontaneous or induced abortion [1]. The retention of placental tissue is suspected in the case of persistent postpartum or post-abortion uterine bleeding with mildly to moderately elevated serum hCG. Hyperechoic endometrial mass is the most sensitive and specific sonographic feature of RPOC [2]. The diagnosis requires histopathological examination of the evacuated tissue [3, 4].

The introduction of color Doppler ultrasonography has allowed evaluation of blood supply to RPOC. Several cases of RPOC with prominent vascularity have been published. These include ~~hypervascular~~ placental polyp, which is defined as intrauterine mass formed by fibrin deposition around degenerated retained placental tissue, with prominent vascularity and RPOC mimicking arteriovenous malformations [5] [6-10]. These hypervascular RPOCs present a clinical challenge, because simple D&C could lead to life-threatening hemorrhage. Indeed, invasive treatment such as uterine artery embolization (UAE) or hysterectomy was performed in most of these cases.

According to a recent report, nearly 20% of RPOCs had marked vascularity [11], which are more common than previously thought. Timmerman et al. assessed spontaneous outcome of 30 cases of uterine vascular malformation that is defined as an abnormal hypervascular area with turbulent flow in the myometrium on color Doppler imaging [12]. Remarkably, expectant management was successful in more than two-thirds of the cases, raising the possibility that expectant management is an appropriate option in many of the cases of uterine hypervascular lesion. Although intramyometrial peak systolic velocities tended to be lower in the cases that were treated expectantly as compared with those required UAE, the difference was not statistically significant [12]. For the present, there is no reliable measure to predict future spontaneous massive hemorrhage from the uterine hypervascular lesion.

Here, we report two cases of hypervascular RPOC that were successfully managed with two different approaches.

Case Report

Case 1

A 26-year-old woman (gravida 4, para 1: artificial abortion 2, spontaneous abortion 1, vaginal delivery 1) with history of 3 dilations and curettages (D&C's) consulted our hospital for lower abdominal pain with small amount of vaginal bleeding. Transvaginal ultrasonography (TV-USG) showed gestational sac (GS) of 6.9 mm in lower part of the uterine cavity (Figure 1A). The day after, she spontaneously passed chorionic tissue followed by relief of the lower abdominal pain. When she revisited our hospital 7 days after the spontaneous passage, GS was no longer detected on TV-USG. Vaginal bleeding was markedly decreased but still continued intermittently.

She was transported to the emergency room due to repetitive heavy vaginal bleeding 45 days after the spontaneous passage. On arrival, vaginal bleeding subsided and her vital condition was stable with hemoglobin level of 12.4 g/dl. TV-USG showed round heterogenous mass in the lower uterine segment, which contained anechoic space with brisk color Doppler blood inflow from the right uterine artery (Figure 1B). Spectral Doppler analysis demonstrated the presence of low-impedance arterial flow ~~with peak systolic velocity of 70 cm/s~~ (Figure 1C). Moderate color Doppler flow in the rim of the mass (Figure 1B) combined with mildly elevated serum hCG (142 mIU/ml) suggested the retention of chorionic tissue. From these findings, the diagnosis of retained product of conception (RPOC) with aneurysm-like structure was considered.

Magnetic resonance imaging (MRI) also revealed round mass with heterogenous intensity in T2-weighed MRI (Figure 1D) and relatively low intensity in T1-weighed MRI (Figure 1E), which was considered to reflect blood of various time courses. In gadolinium-contrasted T1-weighed MRI, the anterior portion (aneurysm-like structure) and the posterior rim (retained chorionic tissue) of the mass were markedly enhanced (Figure 1F).

Removal of RPOC was considered to be necessary to prevent relapse of heavy vaginal bleeding. Since immediate D&C could cause intractable hemorrhage, bilateral uterine artery embolization (UAE) using gelatin sponge was performed on the same day. The angiography performed prior to UAE revealed tortuous dilated uterine artery flowing into sac-like structure (Figure 2A). The day after, anechoic space with brisk color Doppler flow disappeared (Figure 2B). The patient suffered from uterine

cramping pain for a few days, which necessitated opioid analgesics. Four days after the UAE, her serum hCG level declined to 31.5 mIU/mL and D&C was successfully carried out. Seven days after the D&C, no apparent retention or abnormal power Doppler flow was detected in the lower uterine segment (Figure 2C). Degenerated chorionic villi were microscopically found in the evacuated tissue and the diagnosis of RPOC was confirmed. Her serum hCG fell below measurable limits 39 days after and her menstrual cycle resumed 56 days after the D&C.

Case 2

A 37-year-old woman (gravida 1, para 1) with history of 1 low transverse cesarean section at 28 weeks of gestation for premature rupture of membrane became pregnant after regular menses. TV-USG at 8 weeks of gestation showed GS of 25.8 mm in relatively lower part of the uterine cavity (Figure 3A). Cesarean scar ectopic pregnancy was unlikely because GS did not directly contact with the previous cesarean scar. D&C was carried out under the diagnosis of missed abortion. Her serum hCG level prior to D&C was 88,847 mIU/mL. No retention was detectable in the uterine cavity immediately after the procedure (Figure 3B). Seven days after D&C, sonographically heterogenous mass of 2 cm emerged in the vicinity of the previous cesarean scar (Figure 3C), although her serum hCG declined to 9,407 mIU/mL. Thirteen days after D&C, the mass grew to 3 cm. Gestational trophoblastic disease was unlikely because her serum hCG level further declined to 3,408 mIU/mL. T2-weighed MRI revealed that round mass of heterogenous intensity in the lower uterine segment with extremely thinned previous cesarean scar (Figure 3D). Magnetic resonance angiography showed prominent vascularization in the mass (Figure 3E). Development of hypervascular placental polyp was considered and she was referred to our hospital 28 days after D&C. Small amount of vaginal bleeding was continued after D&C, but no other remarkable symptom was noted.

At her first examination, amount of vaginal bleeding was scanty and her vital condition was stable with hemoglobin level of 12.6 g/dl. TV-USG showed pear-shaped heterogenous mass in the lower uterine segment, which had further grew to 5 cm. No color Doppler flow was detected inside the mass, indicating that vascularity of the placental polyp had been spontaneously reduced. However, brisk color Doppler flow was still observed at the boundary between the mass and the surrounding

myometrium. Spectral Doppler analysis demonstrated the presence of low-impedance arterial flow ~~with peak systolic velocity of 27 cm/s~~ (Figure 4B). Moderately elevated serum hCG (384 mIU/mL) suggested the retention of chorionic tissue ~~and the diagnosis of hypervascular placental polyp was considered~~. Since her vaginal bleeding was only scanty amount and immediate D&C could cause intractable hemorrhage, expectant management with oral methylergometrine maleate was instituted, anticipating possible reduction of the blood supply and eventual spontaneous passage of the placental polyp. She was thoroughly informed of the possibility for spontaneous massive vaginal bleeding and referred to interventional radiologist in preparation for potential emergency UAE. Small amount of vaginal bleeding intermittently continued throughout the waiting period, which was well tolerated. Sixty-one days after D&C, her serum hCG level declined to 1.12 mIU/ml and power Doppler flow towards the placental polyp became undetectable (Figure 4C). The placental polyp shrunk to 3 cm, but the spontaneous passage seemed unlikely because of tightly closed uterine cervix. Thus, the second D&C was performed under USG guidance not to perforate the previous cesarean scar. Some difficulty was encountered in removing the polyp from the previous cesarean scar. The day after, no apparent retention was observed on TV-USG (Figure 4D). Ghost cell-like trophoblasts were microscopically found in the evacuated tissue and the diagnosis of placental polyp was confirmed. Her serum hCG fell below measurable limits 17 days after and her menstrual cycle resumed 54 days after the removal of the placental polyp.

Discussion

Excessive myometrial invasion by trophobalsts could be one of the causes for prolonged retention of chorionic tissue in the uterus after removal of the conceptus. In this situation, physiological maternal arteriovenous shunting in the placental bed could persist and even expand, leading to the development of retained product of conception (RPOC) with prominent vascularity. In this respect, excessive trophoblast invasion could be one of the underlying etiologies for hypervascular RPOC. On the other hand, it is well known that excessive trophoblast invasion is also the primary basis of the development of placenta accreta late in pregnancy. Accordingly, reported risk factors for placenta accreta such as prior cesarean deliveries and history of multiple D&Cs [13, 14] could also be the predisposing factors for the development of hypervascular RPOC. Moreover, since endometrium is thin and decidual formation tends to be insufficient in lower part of the uterus, embryo implantation in this part could induce excessive trophoblast invasion, which might be one of the reasons for the association between placenta previa and accreta. Interestingly, embryo implantation occurred in relatively lower part of the uterus in both of our cases. Moreover, history of 3 D&C's was noted in case 1 and prior cesarean section in case 2. Thus, both of our cases carried high risk for exaggerated trophoblast invasion that could lead to the development of hypervascular RPOC. In fact, some difficulty was encountered in removing the placental polyp from the previous cesarean scar in case 2.

Evaluation of the vascularity is important to determine treatment strategy for RPOC, because simple D&C against hypervascular RPOC can lead to intractable bleeding that may necessitate life-saving hysterectomy. Thus, we took stepwise treatment approach to hypervascular RPOC. First, we tried to reduce the blood supply to RPOC either by uterine arterial embolization (UAE) in case 1 or prolonged expectant management in case 2. At the present time, there is no reliable measure to predict future spontaneous massive hemorrhage and expectant management with or without uterotonics might be preferable to invasive UAE as long as the vaginal bleeding is mild and the patient is hemodynamically stable [15, 16]. In the case of expectant management, however, patient should be informed of possibility for spontaneous massive hemorrhage that may require emergency UAE or, at worst, hysterectomy. After the blood supply became nearly undetectable on color Doppler ultrasonography, D&C was performed in both of our

cases, although spontaneous passage of RPOC has been reported [9, 11, 16]. In case 1, D&C was performed 4 days after UAE for fear of possible recurrence of aneurysm-like structure after recanalization of the uterine artery that had been temporarily occluded with gelatin sponge. In case 2, we waited for 2 months but it appeared that relatively large size of the placental polyp and tightly closed uterine cervix hampered the spontaneous passage.

In conclusion, simple D&C of hypervascular RPOC should be deferred until its vascularity is sufficiently reduced. Since there is currently no reliable measure to predict future spontaneous massive hemorrhage, expectant management may be preferable to emergency UAE as long as the condition of patients allows. Future studies should characterize hypervascular RPOC that causes spontaneous heavy bleeding and not eligible for expectant management.

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Figure Legend

Figure 1. Ultrasonographic and magnetic resonance images before uterine arterial embolization in case 1. (A) Transvaginal gray-scale ultrasonogram shows gestational sac in lower part of the uterine cavity, which spontaneously passed through vagina the next day. (B) Transvaginal color Doppler ultrasonogram 45 days after the spontaneous tissue passage shows emergence of round heterogenous mass in lower part of the uterine cavity that contains anechoic space with brisk color Doppler blood flow, indicating the formation of aneurysm-like structure. Note moderate color Doppler flow in the rim of the mass (arrows) that represents retained chorionic tissue. (C) Spectral Doppler analysis on the blood flow into aneurysm-like structure reveals low-impedance arterial waveform with peak systolic velocity of 70 cm/s. (D) T2-weighed magnetic resonance image shows heterogenous-intensity round mass (arrow). (E) In T1-weighed magnetic resonance image, the mass shows relatively low intensity representing blood of different ages. (F) Gadolinium (Gd)-contrasted T1-weighed MRI shows marked enhancement in the anterior portion (aneurysm-like structure, closed arrow) and the posterior rim (retained chorionic tissue, open arrow) of the mass.

Figure 2. Angiographic and ultrasonographic images before and after uterine arterial embolization (UAE) in case 1. (A) Angiography performed before UAE reveals tortuous dilated uterine artery (arrow) flowing into sac-like structure (arrowhead). (B) Transvaginal color Doppler ultrasonogram 1 day after UAE shows complete disappearance of the aneurysm-like structure in the mass (arrow). Four days after UAE, the avascular mass was safely removed with dilation and curettage (D&C). (C) Transvaginal power Doppler ultrasonogram 7 days after D&C shows no detectable retention in lower part of the uterine cavity (arrow).

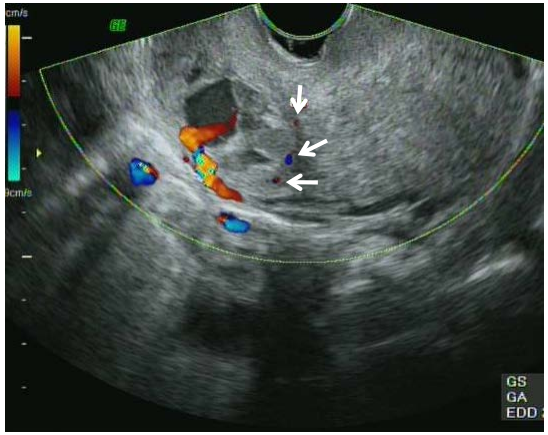
Figure 3. Ultrasonographic and magnetic resonance images before referral to our hospital in case 2. (A) Transvaginal gray-scale ultrasonogram before dilation and curettage (D&C) shows gestational sac in lower part of the uterine cavity. (B) Transvaginal gray-scale ultrasonogram immediate after D&C shows no detectable intrauterine retention. (C) Transvaginal gray-scale ultrasonogram 7 days after D&C shows emergence of heterogenous round mass in lower part of the uterine cavity

indicating the formation of placental polyp. (D) T2-weighed magnetic resonance image 13 days after D&C shows heterogenous-intensity placental polyp in the vicinity of thinned previous cesarean scar (arrowhead). (E) Magnetic resonance angiography (MRA) 13 days after D&C shows prominent vascularization (arrow) in the placental polyp.

Figure 4. Ultrasonographic images after referral to our hospital in case 2. (A) Transvaginal color Doppler ultrasonogram 28 days after dilation and curretage (D&C) shows pear-shaped heterogenous placental polyp (broken line) with brisk color Doppler blood flow (arrow), indicating the presence of feeding vessel. (B) Spectral Doppler analysis on the feeding vessel reveals low-impedance arterial waveform with peak systolic velocity of 27 cm/s. (C) Transvaginal color Doppler ultrasonogram 61 days after D&C shows disappearance of power Doppler flow towards the placental polyp and the avascular placental polyp was safely removed with the second D&C. (D) Transvaginal gray-scale ultrasonogram 1 day after the second D&C shows no detectable retention in the uterine cavity.

(A)

(B)



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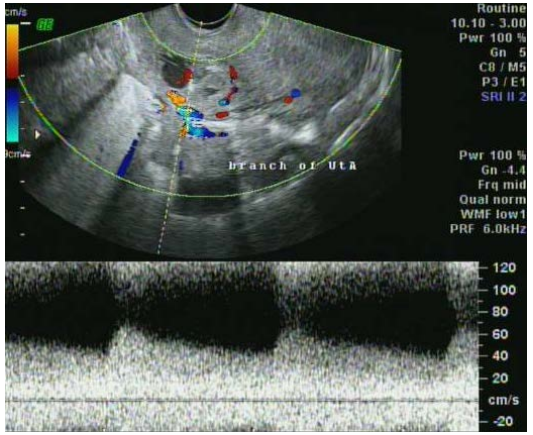

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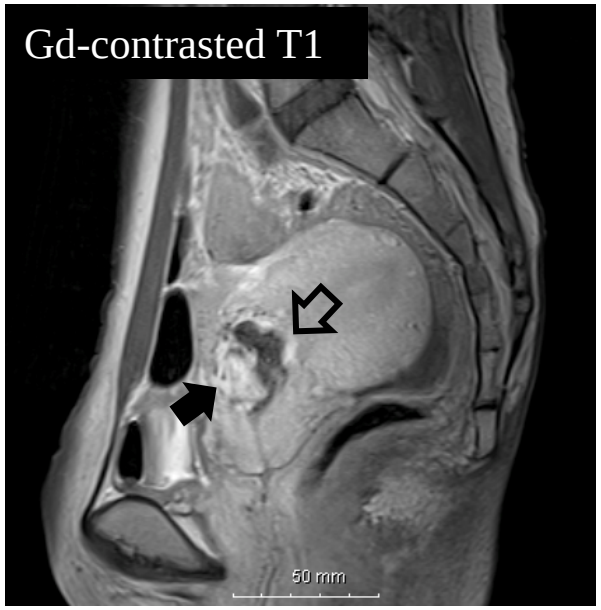

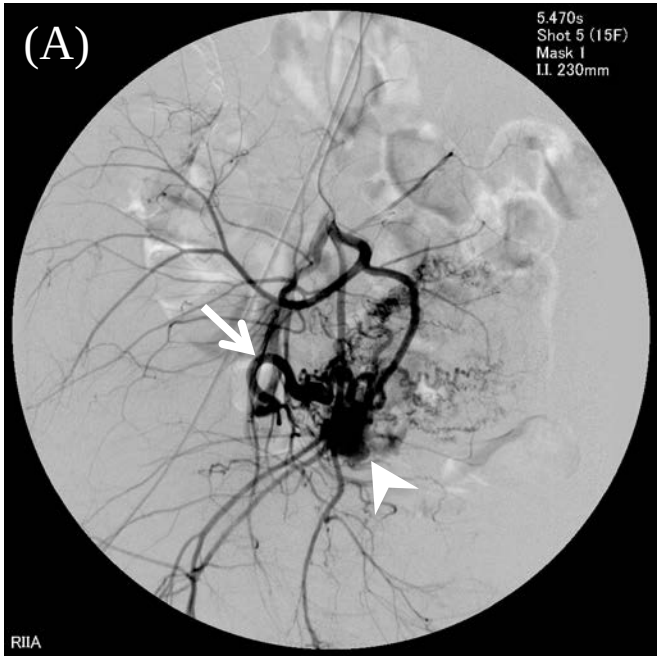

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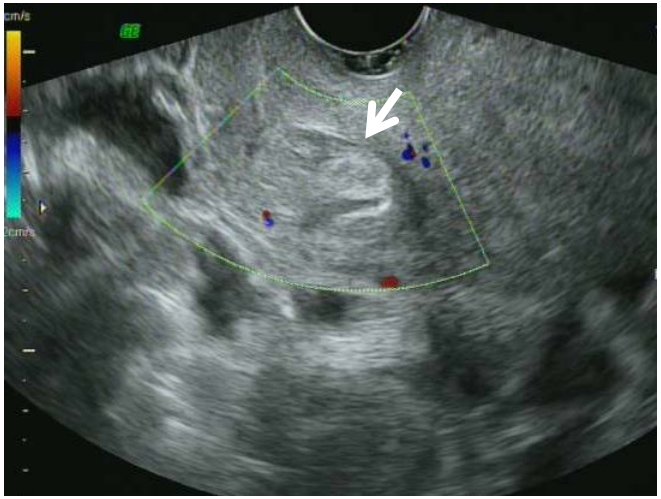

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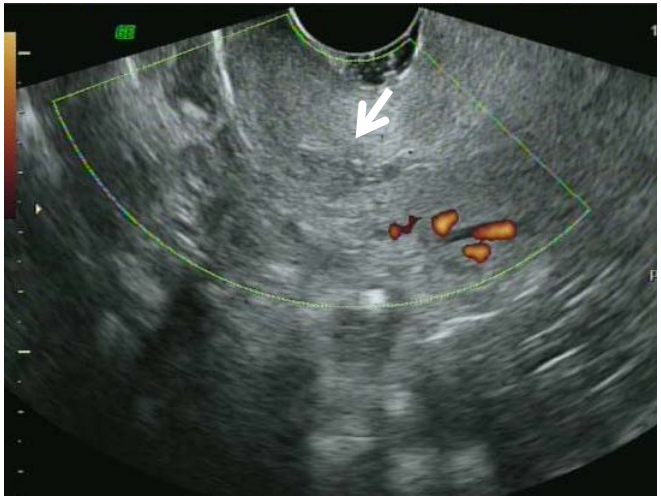

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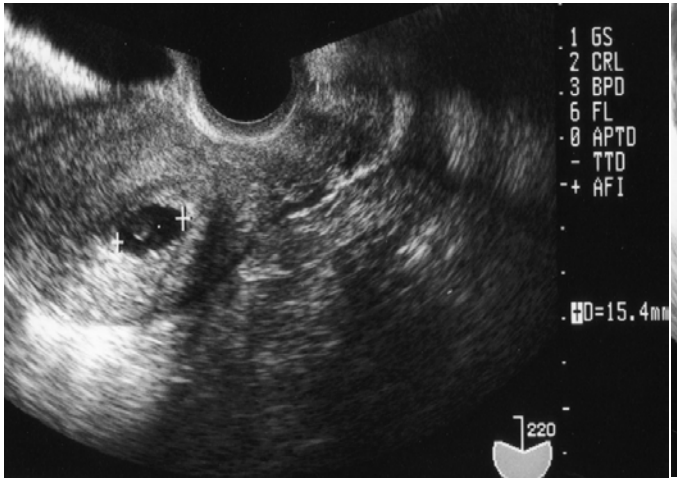

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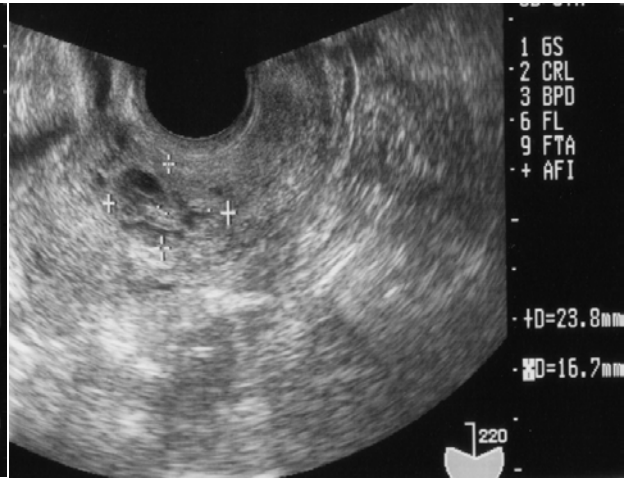

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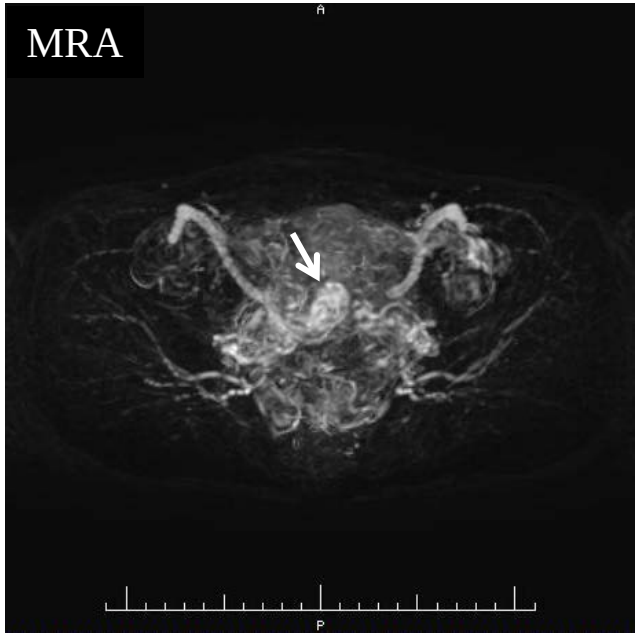

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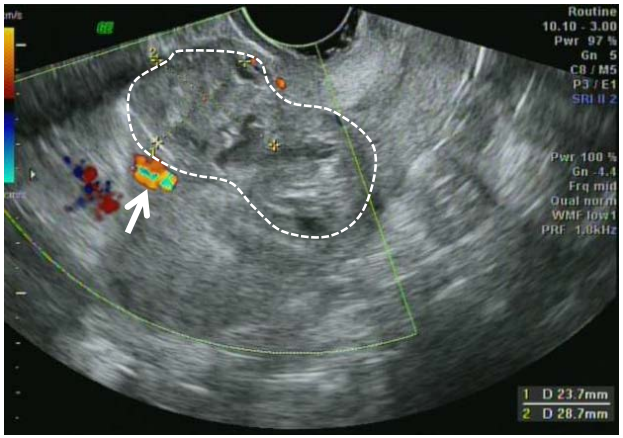

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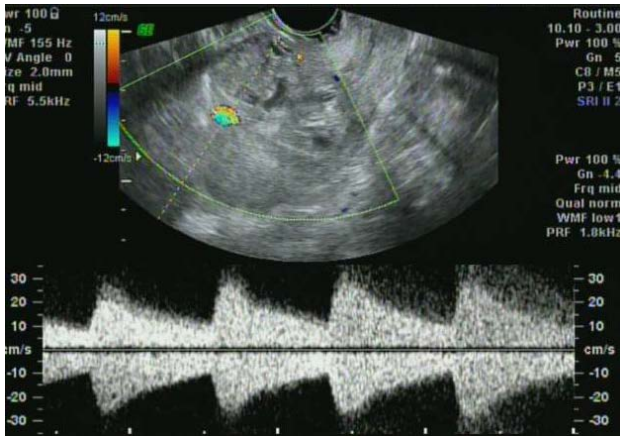

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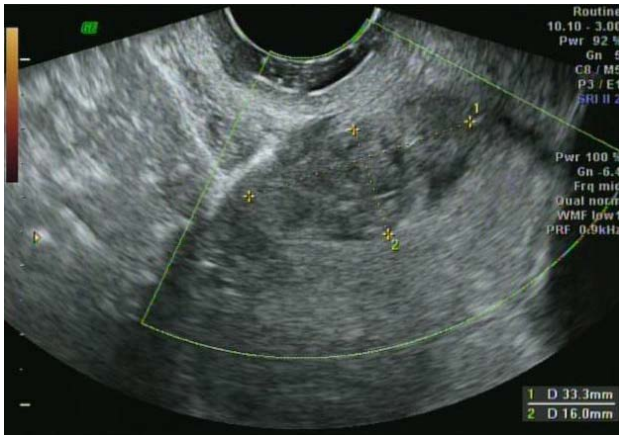

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